THE JAMES BAY POWER PROPOSAL

by

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Flying low over the vast Quebec wilderness east of James Bay, the observer can glimpse complex terrain below — muskeg and forest, alternating with hundreds of small lakes set in the ancient Precambrian rock of the Canadian Shield. This is the subarctic, and Hudson Bay itself is the predominating influence. Cold waters of the Bay force plant zones and treeline farther south here than in any other continental region of the world. Ice covered in spring, and very cold in summer, the large water mass lowers the air temperature and causes the formation of fog, retarding plant growth. Melting of the ice begins in May, but throughout the summer, cold Arctic air sweeps down unmodified along Hudson Bay into northern sections of Ontario and Quebec. In effect, Quebec and Ontario have an Arctic Ocean along their northern boundary.[1]

Mrs. Glooschenko, a biologist by training, has been associated with environmental groups at Burlington, Ontario. This article developed out of a study of the James Bay Proposal which she has been commissioned to make by the Sierra Club of Ontario.

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White spruce marks the windswept James Bay coastline, which serves as the staging area for practically all of the Blue Geese in Canada. Leaving northern nesting sites in early September, these birds descend on the rich tidal flats of east James Bay in great numbers. Along with a few flocks of Lesser Snow Geese and the common Canada Goose, the birds rest and forage at the intertidal zone for several weeks before making the long flight south to wintering grounds along the Gulf of Mexico. Akimiski Island, a bird sanctuary, and Twin Islands, denning spots for the polar bear, lie offshore. Each fall, eel grass beds south of Charlton Island feed approximately 100,000 Eastern Brant, 90 percent of the world population of this species.

Inland from the coast, black spruce and balsam fir form the closed forest association, along with broad-leaved trees like white birch, aspen, and balsam poplar. Alder often creates thickets along the watercourses. Furbearers include the river otter, muskrat, wolf, and lynx, and the beaver is especially important to the native people for food and fur. Woodland caribou and moose are the large game animals of the area. Caribou is found in mature coniferous forest, while the moose depends on submerged aquatic vegetation during the summer, turning to twigs and shrubs throughout the winter months. Beaver, moose, and caribou are vital sources of food for 6000 Cree who trap and hunt in the James Bay region. Seasonal geese, and fish resources such as lake trout and whitefish also supplement the protein requirements of the native people.

Proceeding north and east, the traveller sees the closed forest canopy give way to the taiga or open boreal forest, described as one of the most picturesque, colorful, and extensive landscapes of the continent.[2] Tall spruce stand several yards apart in a sea of *Cladonia*, the caribou lichen or reindeer moss. These lichens cover the forest floor in pastel shades, and retain the impress of footprints for many years. In northern James Bay, the country is particularly beautiful in early summer when flowering herbs and heaths contrast against lichen-covered granite and reindeer moss.

The Cree who make this land their home are a self-sufficient people, living in five main bands ranging from the treeline south to Lake Waswanipi and east to the caribou country around Lake Mistassini.

THE JAMES BAY PROJECT

On April 29, in Quebec City's darkened Colisee hockey rink, Premier Robert Bourassa dramatically revealed his administration's plans for over 100,000 square miles in the James Bay region. The 9,500 seat sports arena was sparsely filled with 3,000 Liberal Party members who had paid five dollars apiece to hear the announcement which was given wide-screen stereophonic sound treatment. Party members watched the words "La Baie James" stretched over three large side-by-side screens, followed by the cost and the number of jobs to be created. The words "The world begins today" . . . resounded through the rink as music built up to a crescendo — and the James Bay project was launched.

Promising from 125,000 to 138,000 jobs, total development of the project will affect drainage basins in 144,000 square miles, an area one quarter the size of the province of Quebec. The project calls for the creation of five to ten of the world's largest dams, two new airports, one new ocean port, and a total of 500 miles of new roads into the wilderness. Five to seven river basins may eventually be involved, and the first phase could call for the development of the Nottaway, Broadback, and Rupert Rivers as part of a complex. The first two rivers will be diverted into the third through an elaborate tunnel system, and the entire "NBR" system will flood 1,700 square miles, an increase of 50 percent in the present water surface area in the virgin territory.

Total power output of the NBR system is estimated at 5,545 MW (megawatts) at a cost of $4.1 billion. Development of the Eastmain and the La Grande, more northern rivers, is expected to produce a total of around 12,000 MW at a cost of $7 to $10 billion.

A major unsettling factor about the project is its urgency. Nine days of tumultuous debate in the National Assembly in May revealed that Bourassa had made his announcement before the basic feasibility reports for the huge project were completed. Hydro-Quebec's annual report in March, 1971, listed the James Bay development as a "Project under Study", noting that it would send out teams that spring to gather basic hydrological data, and did not expect engineering studies to be completed until fall. Close questioning by members of the National Assembly on comparative costs of energy at Churchill Falls, at Manicouagan, for James Bay, and for nuclear plant development produced no answers; Hydro didn't want to give the details on the basis that it was not in the public interest to reveal them.

It was recently disclosed, however, that Hydro-Quebec had commissioned a Philadelphia firm, United Engineers and Constructors, Inc., to study costs of nuclear and thermal plants last summer. The confidential study, completed and submitted to Hydro-Quebec on August 23, 1971, remained secret until early February when it was leaked to a Quebec newspaper. The study suggests that nuclear powerplants would be a cheaper alternative to the giant James Bay plan, contradicting engineering reports on James Bay development that were made available to the National Assembly in May. When questioned about the Hydro-Quebec confidential report, James Bay Development Corporation president Pierre Nadeau said he had never seen it.

One reason indicated for the rush in launching the development was the fulfillment of Bourassa's election promise of 100,000 jobs in 1971. Preliminary reports urging the development of the region cite a maximum of 138,000 jobs to be created both directly and indirectly, with a peak of 45,000 jobs created by construction alone. However, Hydro-Quebec's presentation to the National Assembly indicated a peak of 20,000 temporary jobs at the height of construction in 1977, and it is known that orders for heavy machinery will be filled outside of the province, eliminating many of the "indirect" jobs for Quebecers. Collaborating with 9 Cabinet ministers, the Quebec Office of Planning and Development produced a report earlier last year cautioning that important construction work would not begin until 1976 so that adequate preliminary studies could be finished, and stated that the project would actually create only about 10,000 jobs directly. This report is not available to the public at the present time.

THE JAMES BAY DEVELOPMENT ACT

In June 1971, however, the James Bay Region Development Act (Bill 50) was signed into law. It created the James Bay Development Corporation to "promote the development, exploitation, and harnessing of natural resources" in the vast territory lying between the 49th and 55th degree of latitude. The bill grants wide powers and rights, and imposes few obligations on the Corporation, which will control 50 percent of the shares of all hydro-electric resources in the area, 40 percent of the remainder being held by Hydro-Quebec. As well, the Corporation will control 51 percent of the shares for joint activities with mining, petroleum, and forestry subsidiaries (SOQUEM, SOQUIP, and REXFOR), and may create any other agency for the exploitation of other natural resources, including tourist, fish, and game, providing it holds at least 51 percent of the shares.

Although Bill 50 Provides that "The Corporation must see to the protection of the natural environment and prevent pollution in the territory," Section 42 of the Act indicates that provincial laws respecting protection of natural resources do not apply whenever they are in conflict with the aims of Bill 50.[3]

The Corporation also has total powers of expropriation, which it may exercise "with respect to any immoveable, even one devoted to public use and not subject to expropriation under any general law or special act."[4] The powers granted to the Corporation under Bill 50 came under heavy criticism in the National Assembly, where one member claimed it would effectively set up a state within a state.

NATURAL RESOURCES, ECONOMICS AND POWER NEEDS

Promising side benefits coming from mining and forestry after "opening up" the area by access roads may seem less inviting after close examination. Mr. Pierre Nadeau, President of the James Bay Corporation, has stated that mineral resources in the area are an attractive economic consideration and are simply awaiting suitable means of transportation. However, it is not even known if marginal mines in the area can be operated without financial loss. Quebec Natural Resources Minister Gilles Massé recently announced that a newly formed interdepartmental development office for northwestern Quebec has just been given a $500,000 grant to study the question. It is feared that public subsidy may lead to the construction of mining access roads in what may be marginal operations.

Even the question of economically harvesting timber in the areas of James Bay scheduled for flooding has arisen. André Lafond, Dean of Laval University Forestry Research Foundation, has written that if the volume of wood coming from the James Bay area would affect markets for farmers owning small woodlots in east Quebec (where woodlots are an important source of income and where unemployment in recent years has reached 30 to 40 percent), then the private woodlots should have precedence "even if it means that the wood from the James Bay area has to be flooded."

Harvest of between 6 to 13 million cords from the area to be flooded would cost the province many hundreds of millions of dollars. However, drowning 1,700 square miles of black spruce and muskeg will fill the new reservoirs with floating debris, and leave hundreds of miles of tangled logs and dead standing trees in the shallow water. In this climate, the rotting timber may still be there in 60 years, a legacy for coming generations.

It appears that the James Bay project, if it is implemented, will ultimately cost the taxpayers of Quebec a

great deal. Development of the "NBR" complex, the first phase, will cost $4.1 billion for the production of approximately 5,550 MW. The immense Churchill Falls development will eventually produce 5,250 MW of electricity at a cost of one-third to one-half that amount. There is no evidence that Premier Bourassa has large amounts of foreign investment from New York or elsewhere to finance the project, and borrowing that amount will place a great burden on future governments and the taxpayer.

Apparently costs for James Bay are already escalating; the budget for road construction has gone from $250,000 per mile to an actual cost of $360,000 per mile. In addition to providing only a fraction of the promised jobs, an economist at a recent January workshop on the James Bay project at McGill University in Montreal has warned of a serious lack of financial accountability in the James Bay development scheme. The one-day McGill workshop was attended by over 100 concerned professional and lay people representing 10 organizations, including an outspoken group of young Indians. They asked why provincial power needs must double each 10 years, when the Quebec population takes four times that long to double. It was pointed out that industrial use of power has decreased in proportion to domestic use, and some of the demand was itself created by excessive advertising. Beginning around 1980, under present Hydro projections, a nuclear installation the size of Ontario's Bruce 3,000 MW plant will be needed in Quebec every two years, or a massive Churchill Falls project every 2½ years. No one, however, has projected when the upward curve for power demand must level off.

BIOLOGICAL EFFECTS OF FLOODING

Engineering maps show that the first area to be flooded will affect a drainage basin of over 50,000 square miles. In the "NBR" area, Hydro-Quebec estimates that 1,700 square miles of woodland will be submerged; Lake Mistassini, doubled in size from its present 900 square miles, will fluctuate as much as 20 feet when drawdown occurs. Up to 70 feet in fluctuation is predicted for the Waswanipi reservoir on the Nottaway River, and one reservoir on the La Grande River in the northern basin is scheduled for a 223 foot drawdown! Actual flooding will, of course, displace or eliminate animal life in the areas indicated, and due to fluctuation, the edges of the new reservoir will soon become barren mud flats, unable to support life. The shoreline will be a tangle of dying trees if the forest is left uncleared, and even if the water levels were maintained, decades would pass before animal habitat could re-establish here.

All food fish in the James Bay region are littoral spawners, meaning that they must lay eggs in shallow, inshore areas on gravel bars or on vegetation. Eggs of fall spawning whitefish, lake char, and brooktrout will be exposed to freezing or dying by changing levels in the shallow water. Essential sources of food for larger fish, the shiners and minnows, often spawn in spring and early summer in the same inshore area. Thus, the most desirable fish will diminish and disappear from those areas flooded by fluctuating reservoirs, and slow growth rate in these waters means that replacement with less desirable species may take several decades.

Research has shown that reservoirs follow a cycle after filling, first increasing in productivity due to organic material in the water, then declining in plant and fish production. This is followed by stabilization, requiring 25-30 years in this latitude. Therefore, even those reservoirs with no drawdown will show a drop in production for many years.

Biological effects of changes in salinity and silt deposit on the intertidal zones and offshore islands of James Bay are unknown at present.

NOTTAWAY - BROADBACK - RUPERT COMPLEX

Drainage Basin	Reservoir	Max. Level Feet	Min. Level Feet	Drawdown Feet
NOTTAWAY	*Waswanipi*	945	875	70
	Olga	900	866	34
	Taibi	900	866	34
	Soscumica	825	825	0
BROADBACK	*Kenonisca*	888	844	44
	Evans	820	800	20
	Giffard	800	800	0
RUPERT	*Mistassini*	1,258	1,238	28
	Nemiscau	800	800	0

LA GRANDE RIVER BASIN

Reservoir	Max. Level Feet	Min. Level Feet	Drawdown Feet
Laforge	1,241	1,018	223
Fregate	1,100	1,088	12
Grande Pointe	800	775	25
Sakami	630	610	20
Kanaaupscow	600	-	-
G - 3	580	580	0

THE FORESHORE EFFECT

Maps showing the central areas of flooding mask the actual results. Because of low topography, an additional, unknown number of square miles will be seriously affected away from the reservoirs. Many hundreds of surrounding small lakes and marshes (the foreshore) will be influenced as the main reservoirs rise and fall, contributing to decline in fish and aquatic life. In turn, this will affect mink, river otter, muskrat, beaver, and moose. Lodges and burrows of muskrat and beaver may be exposed, and the young subject to predation. Submerged plants on which the moose depend in summer will be eliminated in many areas. The effect on the native people dependent on these resources over hundreds of square miles is likely to be severe.

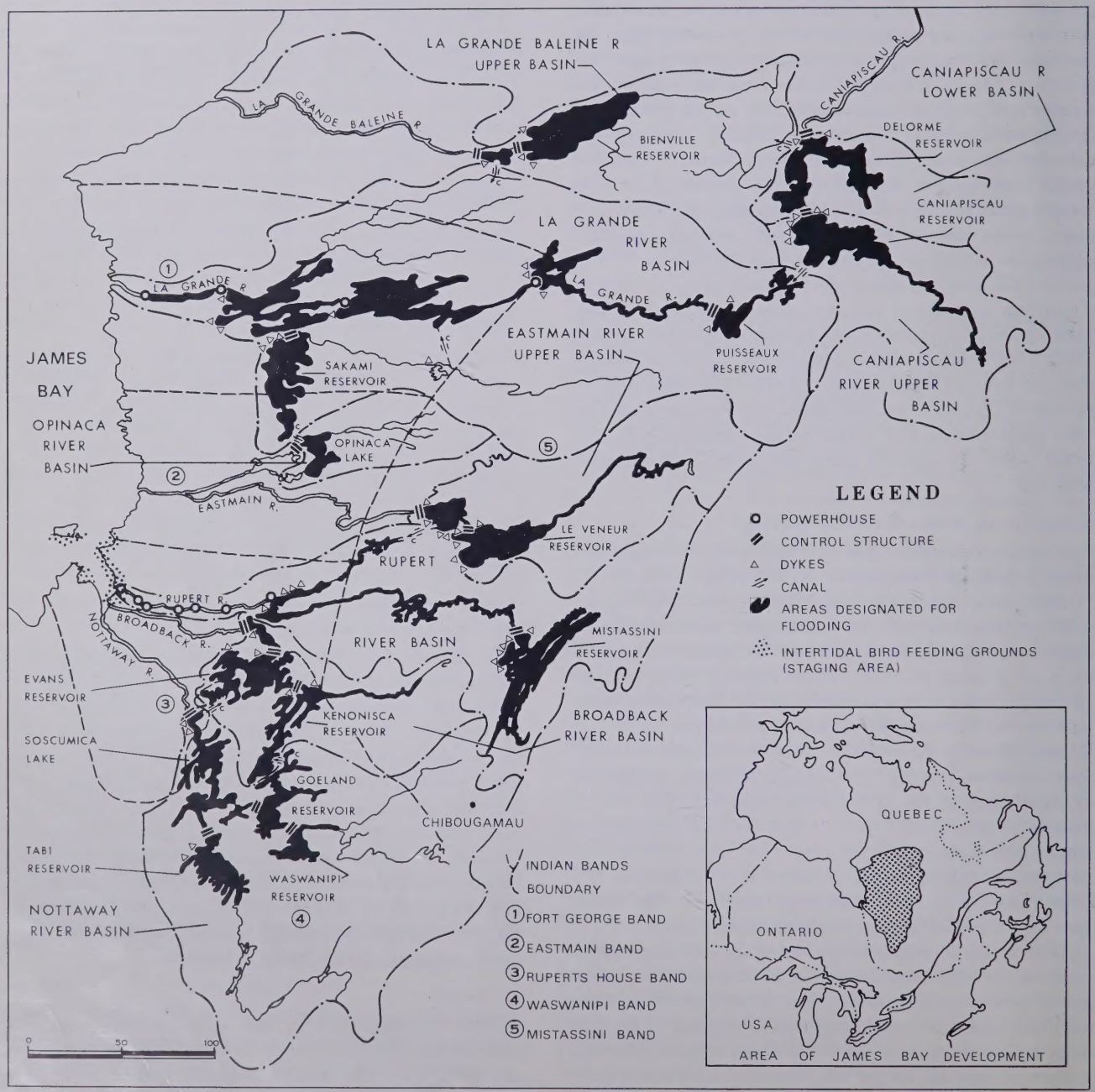
CLIMATE

Climatic changes may be one after-effect of James Bay development not confined to the local area. Ice break-up and warming of Hudson Bay depends on fresh water from the rivers, but dams and river diversions will combine to reduce spring flow and mixing. Dr. Lloyd M. Dickie of the Bedford Institute in Dartmouth, Nova Scotia, has warned that longer winters for Ontario, Quebec, and the Mari-

times, with possibly greater snowfalls, could result if the project continues unaltered. Vegetation limits are already in a delicate state of balance in the Hudson Bay area. Studies have shown that, due to slight differences in annual temperature, the treeline has shifted almost 180 miles in the last 900 years.[5]

THE CREE

The James Bay region is one of the few places in North America where Indians still have an intact culture based on a traditional way of life. Social scientists have noted that the integrity of the various bands has not been undermined by welfare, and that approximately 75 percent of the adult males are dependent on hunting and trapping for a part, or most of the family food or income. Desertion of the traditional way of life has not occurred here, as some have predicted. On the contrary, although the Waswanipi bands live close to the various posts (Matagami, Miquelon, Chapais, and Desmaraisville) all year, over one-half choose to go back into the bush during the winter to maintain themselves by hunting and trapping.

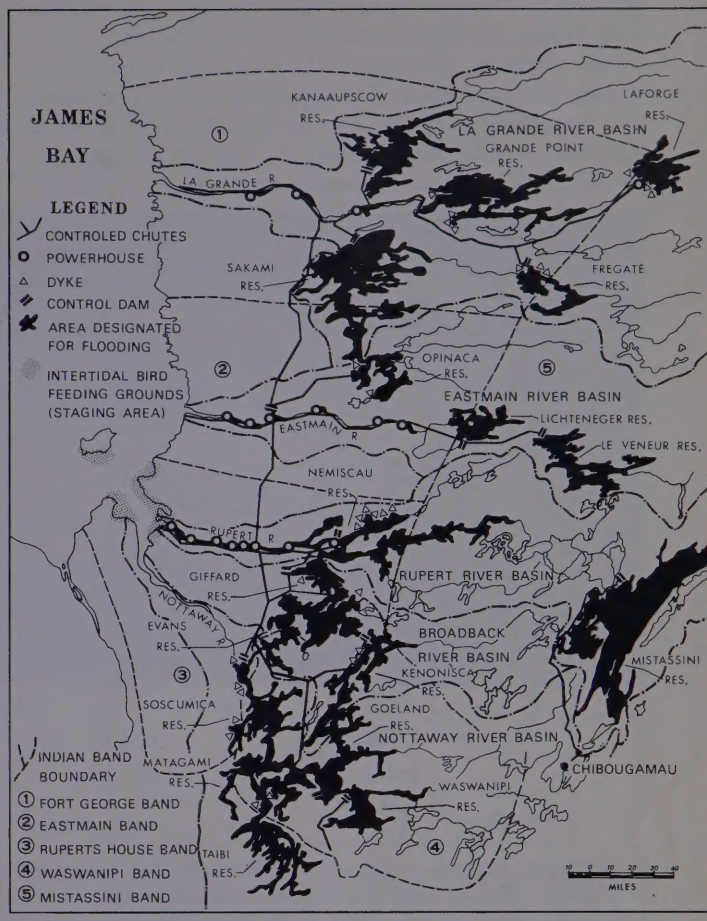


The engineering report illustration on the opposite page shows the alternative developments which are now under consideration by the James Bay Corporation.–based upon the report of Asselin, Benoit, Boucher, Ducherme and Lapointe, Consulting Engineers. The illustration above shows two additional drainage areas which could be developed. This would bring the total area affected to over 170,000 square miles.–based upon the report of Rousseau, Sauvé, Warren and Associates. The two maps were drawn from imperfect xerox copies. Hence they may not be accurate as to some details. Certain structures may have been excluded.

The Indians are dependent on ecological balance for their preferred way of life. For the Waswanipi, beaver accounts for 20-45 percent of total calories, moose approximately 15-40 percent, and fish 1-13 percent. In the fall, seasonal geese provide an essential 7,500 pounds of meat for coastal residents before the start of the trapping season. A study completed last year with a small group of the Mistassini band showed that the diet here was similar to the Waswanipi, but that caribou also formed an important part of the total protein. Destruction of the fish resource is more important than indicated by the numbers, since fish are always a dependable source of food when other game is not available.

Strongly opposing the James Bay project, northern Quebec Indians called on Prime Minister Trudeau last July to ask his personal intervention in seeing that Indian rights in the area were protected. A letter from the Indians of Quebec Association maintained that the territory, traditional hunting and trapping land, belonged to them. Representatives from several bands have appeared at public meetings in Montreal, emphatically backing up the position of the Indians of Quebec Association.

In addition to biological effects of flooding, it is feared that new roads, beginning with a paved highway to Rupert House, will bring in an influx of sports hunters, with possible depletion and overkill of the animal resources. It has been predicted that the number of hunters at the geese staging area will triple immediately, and continue to rise sharply. Canadian Wildlife Service personnel fear that the effect on geese is likely to be severe. In the past ten years, the impact of sports hunting has increased, and one-third of the annual moose kill currently goes to the sports hunting sector. In the late 1960's, officers of the Quebec Department of Fish, Game, and Tourism warned Waswanipi Indians not to hunt outside the several week fall season under threat of prosecution, and regularly searched the winter camps for signs of moose meat, which provides up to 40 percent of the total calories available during the winter. Clearly, development of any of the area resources, particularly massive hydro projects, must be co-ordinated with Indian needs. In the past, this has not been the case, with resulting ecological disruption and social hardship. Premier Bourassa has said only that he did "not think that the Indians will be an obstacle to the development of James Bay."



For explanation see opposite page

THE BELATED ENVIRONMENTAL STUDY

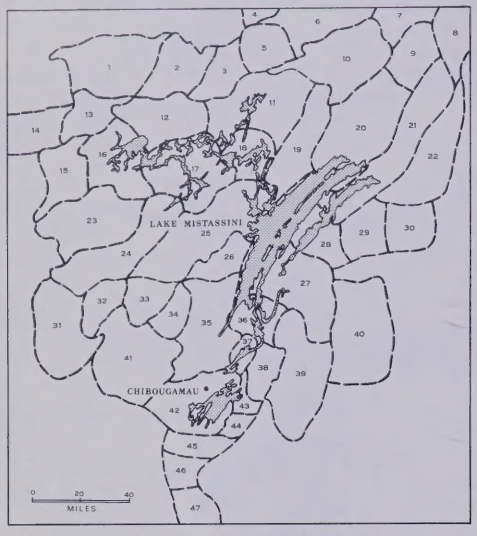
Three months after Premier Bourassa's announcement, the Federal Department of the Environment was asked to examine the environmental implications of James Bay development. At a July meeting, Hydro-Quebec's spokesman André Langlois told federal and provincial scientists that "time constraints would not allow a detailed study," so emphasis was to be placed on existing data rather than on field studies. This information was to be used to identify the major ecological problems and to decide which alternative — the northern or southern river systems — was the better choice for development.

Unfortunately, existing studies for the over 100,000 square mile area are meager. The Federal-Provincial report, operating under time constraint and a limited budget of $30,000.00, said there was insufficient data to support a clear-cut preference between the two river systems. However, it mentioned possible serious effects on migratory birds, adverse conditions from water fluctuations, decrease of desirable fish species, and called for the establishment of a "preserve area" for vulnerable animal species. It stated that the project could have alarming consequences for the Indians in the area. The lack of knowledge was emphasized, and the report recommended a large program of ecological research whose findings would be closely integrated with actual *construction*, assuming that the project goes ahead.

Uncomfortable similarities arise in a comparison of James Bay with the Peace-Athabasca delta. The W. A. C. Bennett dam on the Peace River in British Columbia has drastically lowered water levels in the delta at the western end of Lake Athabasca in northwestern Alberta. Resulting effects on the delta (approximately one-fiftieth the size of the James Bay river basins) have endangered fish and wildlife and seriously affected 1,300 local residents dependent on fishing and trapping. More than one million dollars will be spent on the first stage of delta restoration to raise water levels in an attempt to reverse ecological damage. In the fall of 1971, Environment Minister Jack Davis blamed the

situation on "narrow provincialism and our haste to produce energy with little or no regard for the future."

Pierre Nadeau, President of the James Bay Corporation, recently told the Montreal District Chamber of Commerce that "we will open up this area for those to whom it would otherwise remain unaccessible. It will provide an opportunity to visit and appreciate this exceptional wilderness." However, if the controversial James Bay project proceeds, the recommended research must precede actual construction, and the results applied as the area is developed. Otherwise, it seems entirely probable that the "exceptional wilderness" will become another Peace-Athabasca disaster on a far grander scale.



Traditional Mistassini Indian trapping territories which have been handed down for generations. Population of the Mistassini band was placed at 1,371 in 1971. About 3/4 of this number actively engage in trapping, and even more depend at least partially on game food.[7]

The author wishes to acknowledge the assistance of Mr. Harvey Feit, Department of Anthropology, McGill University, and Mr. Adrian Tanner, Department of Anthropology, University of Toronto, for background material on the effects of the James Bay project on native peoples. The photographs are by Mr. Peter Borelli, Atlantic Chapter, Sierra Club, New York, and the draftings by Miss Susan Longstaffe. Assistance with biological background information from many sources is gratefully acknowledged, particularly from Dr. Hamish Duthie and colleagues at the University of Waterloo, and Dr. John Spence at McGill University, Montreal.

[1]Burbidge, F.E. 1951. The modification of continental polar air over Hudson Bay. *Quarterly Journal of the Royal Meteorological Society* 77:365-374.

[2]Hare, F. K. 1950. Climate and zonal divisions of the boreal forest formation in eastern Canada. *The Geographical Review* 40:615-635.

[3]James Bay Region Development Act, Bill 50, National Assembly of Quebec. July 14, 1971. Section 42, p. 12. Available from the government of Quebec.

[4]Ibid., Section 28.

[5]Bryson, R. A., W. N. Irving and J. A. Larsen. 1965. Radiocarbon and soil evidence of former forest in the southern Canadian tundra. *Science* 147:46-48.

[6]Minutes, James Bay Environmental Task Force, Ottawa, July 22, 1971.

[7]This illustration adapted from Tanner, A. Existe-t-il des territoires de chasse? *In* La Baie James des Amérindiens, Vol. 1, Nos 4-5. Montreal 130, Recherches Amérindiens au Québec, December, 1971.

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THE FEDERATION'S LOGO

The Canadian Nature Federation's logo is a contribution from Mr. Eric Nasmith of *Eric Nasmith & Associates*, 210 Adelaide Street West, Toronto, Ontario. Mr. Nasmith has been a long-time supporter and member of the Canadian Audubon Society and some of his works have appeared on the cover of *Canadian Audubon.*

As a career artist, earning his "bread" at printing design and as an amateur ornithologist of 15 years experience, he has long been intrigued by the attempt to translate forms seen in nature into summary or symbolic images. He has done symbols for naturalists' groups based on specific forms, such as a hawk, the head of a raccoon or a map.

The CNF symbol was meant to be a distillation of the shapes of a bird, a plant, or a flower. Hopefully, the reader will read into it his own meaning. When printed in a warm red, the symbol takes on the aspect of a torch, implying the challenge that faces naturalists the world over.

Tidal flats *Peter Borelli*

Typical muskeg *Peter Borelli*

Broadback River *Peter Borelli*